CLIMATE ANALYSIS CENTER

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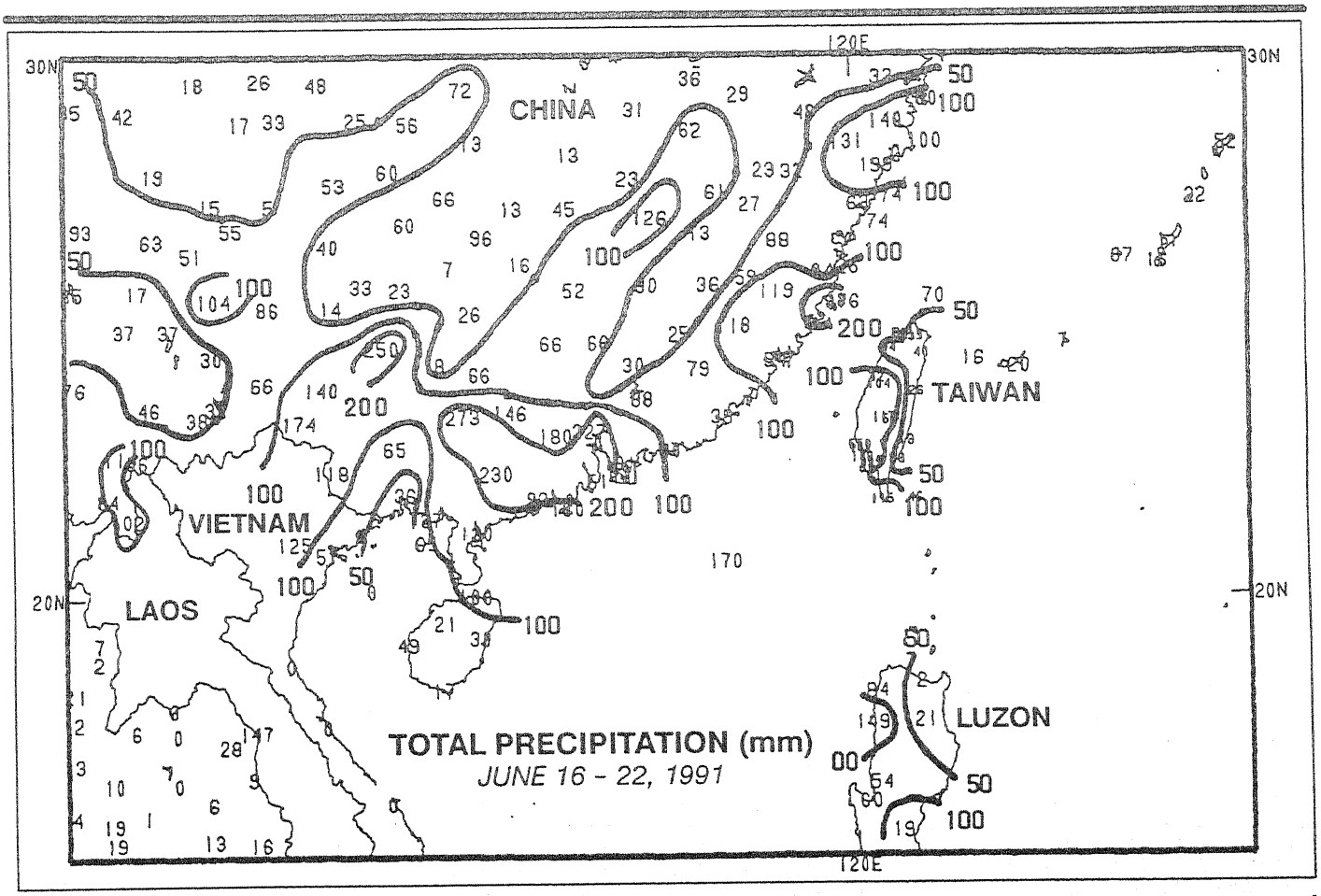
GLOBAL
CLIMATE
ANOMALIES

WEEKLY CLIMATE BULLETIN

No. 91/25 Washington, DC June 22, 1991



The heaviest rains in several months (50-300 mm), some of which fell in association with the remnants of Typhoon Yunya, soaked much of Taiwan, the adjacent coast of China, and Luzon, easing long-term dryness. Taiwan's drought has caused 136 million U.S. dollars in damage to the agriculture and fishery industries, according to press reports. In contrast, torrential late-spring rains in central and northeastern China during the past few weeks took dozens of lives, destroyed 35,000 homes, and ruined one-fifth of Anhui province's harvest-ready crops. Heavy rains also flooded the Yangtze and Huai rivers, causing considerable damage to wheat fields in eastern and central China, according to press reports.

UNITED STATES DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER

CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF JUNE 22, 1991

. Alaska

SUMMER COMMENCES WITH RECORD HEAT.

'he first day of Summer and the latter part of the week featured xceptionally high temperatures across central, northern, and orthwestern Alaska. One location northwest of Fairbanks reached 6°C while weekly departures up to +9°C affected northwestern reas [Episodic Event].

. Central and Southeastern United States:

ABNORMALLY WET WEATHER CONTINUES.

low-moving thunderstorms dumped another 40-125 mm of rain cross the western, central, and east-central Gulf Coast as well as n southern North Dakota, the east-central Dakotas, and western nd southwestern Minnesota. Excessive totals of up to 175 mm ere measured across central and south-central Louisiana and in xtreme northeastern South Dakota. In addition, scattered 50-75 nm amounts were recorded in eastern Montana, Nebraska, and estern Iowa. Since early May, rainfall surpluses of 70-245 mm ave accumulated along the Gulf Coast while isolated departures up o 170 mm were observed in parts of South Dakota and Nebraska 13 weeks].

. Central and East-Central North America:

SOMEWHAT COOLER LATE IN WEEK.

Temperatures above 35°C affected portions of the mid-Atlantic arly in the week, but cooler air had swept through the entire egion by the weekend. Departures of +3°C to +6°C, primarily due o hot weather early in the week, were observed across outh-central Canada, the eastern Great Lakes and Ohio Valley, he central Appalachians, and the northern mid-Atlantic [Ending fter 6 weeks].

. East-Central South America:

HEAVY OUT-OF-SEASON RAINS CONTINUE.

Most of west-central Uruguay and Rio Grande do Sul measured 100-200 mm of rain while 40-100 mm soaked the remainder of the egion, keeping moisture surpluses intact [6 weeks].

. Central and Northeastern Europe:

UNSEASONABLY COOL CONDITIONS PREVAIL.

Weekly departures of -3°C to -7°C were measured across northern France, the Low Countries, Germany, southern Sweden, and central England while temperatures averaged about 2°C below normal elsewhere. Farther southeast, near to above normal temperatures brought an end to the recent cool spell in the Balkans and western Turkey [10 weeks].

6. The Sahel:

ANOTHER RELATIVELY DRY WEEK REDUCES MOISTURE SURPLUSES.

Slightly below seasonable rainfall totals of 20-100 mm wer registered across most of the Sahel, with little or no rain fallin across southern Senegal, western Mali, eastern Sudan, and weste Ethiopia, bringing an end to recent abnormal wetness [Ended afte 9 weeks].

7. The New Lands:

WARM WEATHER CEASES BUT EXCESSIVE DRYNESS CONTINUES.

Below normal rains (5-25 mm) were again measured, but near t below normal temperatures brought an abrupt end to the late Sprin heat wave [Warm - Ended after 5 weeks; Dry - 12 weeks].

8. Western India, Afghanistan, and Pakistan

COOLER AIR MOVES INTO REGION.

Temperatures averaged near normal across most of the region whil weekly departures of -3°C to -5°C were recorded in norther Afghanistan and extreme northwestern India. Before lowe temperatures were observed later in the week, highs reached 42° while apparent temperatures approached 46°C [Ended after weeks].

9. Western and Southern India and Sri Lanka:

RAINFALL TOTALS DROP SHARPLY.

Most locations measured only 20-50 mm of rain, although a fe isolated stations recorded up to 225 mm, bringing a sizable declin in accumulated rainfall surpluses [Ending after 3 weeks].

10. Eastern China:

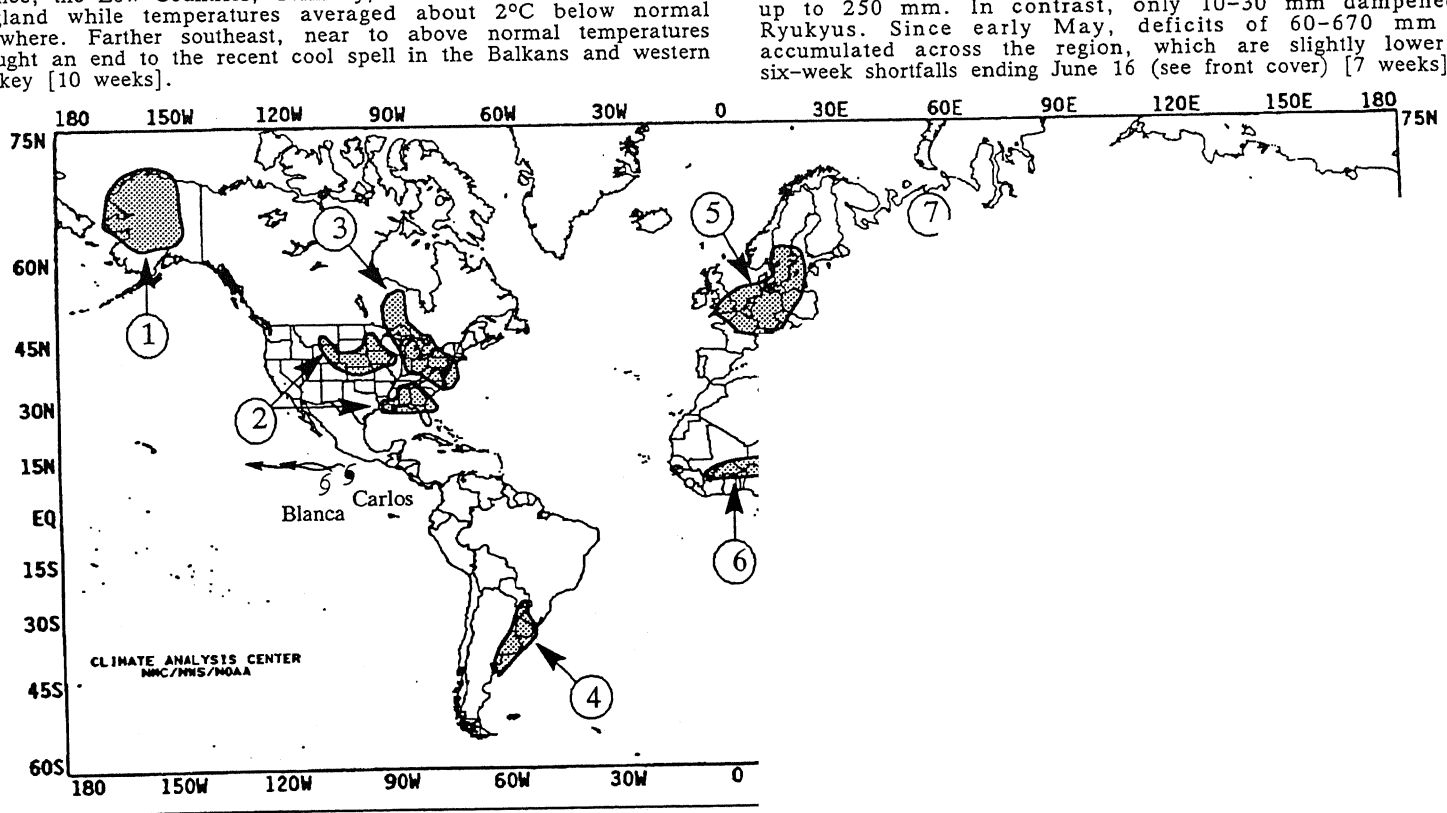
HEAVIEST RAINS DRIFT SOUTHWARD.

Only scattered totals of 20-40 mm were measured from the Yangt River Valley northward while excessive totals fell acros south-central and southeastern China. Most of the latter regio measured 40-90 mm, with amounts of 100-335 mm along the Xu River Valley and coastal southern Fujian eliminating lingerin deficits along the southeastern China coast and producin widespread flooding farther inland, according to press reports weeks].

11. Taiwan, Luzon, and the Ryukyus:

WIDESPREAD HEAVY RAINS BRING LIMITED RELIEF.

Totals of 50-150 mm fell across Taiwan and all but extren northeastern Luzon, with portions of northeastern Taiwan receivi up to 250 mm. In contrast, only 10-30 mm dampened t Ryukyus. Since early May, deficits of 60-670 mm ha accumulated across the region, which are slightly lower th six-week shortfalls ending June 16 (see front cover) [7 weeks].



EXPLAN

TEXT: Approximate duration of anomalies is in brackets. Precipitati

MAP: Approximate locations of major anomalies and episodic even temperature anomalies, four week precipitation anomalies, l

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF JUNE 16 - 22, 1991

Widespread thunderstorms again triggered tornadoes, flash flooding, large hail, and strong winds across the nation's midsection while more scattered showers and thunderstorms soaked much of the Southeast, mid-Atlantic, and portions of the northern Rockies. The heaviest rains fell on Friday, when up to two inches inundated Lincoln, NE in one hour, submerging some streets beneath 4 feet of water. Flash flooding also resulted from 3.25 inches of rain in less than two hours in Madisonville, KY. Large hail pelted portions of the northern and central Plains while tornadoes were scattered throughout the Plains. Soaking rains brought much needed moisture to the mid-Atlantic, providing relief from recent dryness (Figure 2). Widespread flooding affected the Atlanta, GA area, where 3.38 inches of rain fell in one hour, and western South Carolina where about 4 feet of water covered some roads west of Greenville. Temperatures climbed into the triple digits along the mid-Atlantic coast early in the week, but cooler air around mid-week provided relief from the oppressive heat. Abnormally warm weather also prevailed in Alaska, where the mercury soared into the nineties (Figure 1). In contrast, cool air spread across the Northwest as daily record lows were broken during the latter part of the week.

At the beginning of the week, an oppressive heat wave sent temperatures soaring to the 100-degree mark along the mid-Atlantic coast while thunderstorms unleashed flooding in Texas and damaging winds in the Northeast. Thunderstorms were also observed in the Ohio Valley, Appalachians, Tennessee Valley, Gulf Coast states, Rockies, and Northwest. Severe thunderstorm swept through the upper Mississippi Valley around mid-week, producing high wind and large hail, while intense thunderstorms rumbled over the lower Mississippi Valley and Southeast, producing heavy rain and local flooding.

During the latter half of the week, thunderstorms raked the Plains and Mississippi Valley with tornadoes, hail, and high winds. Showers and thunderstorms were also spread over the Southeast, Ohio Valley, mid-Atlantic, northern Rockies, and Northwest. Up to 3 inches of rain in Montana caused creeks in Glacier Park to swell, forcing the evacuation of campers. A cold front pushed across the Pacific Northwest, dropping temperatures as a number of stations set record daily lows. In contrast, Friday was the hottest summer solstice on record for northern and central Alaska as highs reached 94°F in Fairbanks.

According to the River Forecast Centers, the greatest weekly totals (more than 2 inches) fell on the southern Plains, lower Mississippi Valley, Southeast, southern and central Appalachians, and mid-Atlantic (Table 1). More scattered amounts above 2 inches were recorded in the central and northern Plains, middle and upper Mississippi Valley, Ohio Valley, northern Rockies, and southern Alaska. Light to moderate rainfall was measured in the remainders of the Great Plains, Mississippi Valley, mid-Atlantic, northern Rockies, and Alaska as well as across the Pacific Northwest and Hawaii. Little or no rain fell on the Southwest, the Intermountain West, the central and southern Rockies, and portions of the Great Lakes.

Warm weather again overspread much of the nation from the Great Basin to the East Coast (Table 2). Weekly departures greater than +6°F were found in the upper Ohio Valley and in much of Alaska, with departures reaching +17°F in the latter region. Departures of +3°F and greater were common over the Great Lakes and mid-Atlantic and in parts of the Great Basin, Great Plains, and Southeast.

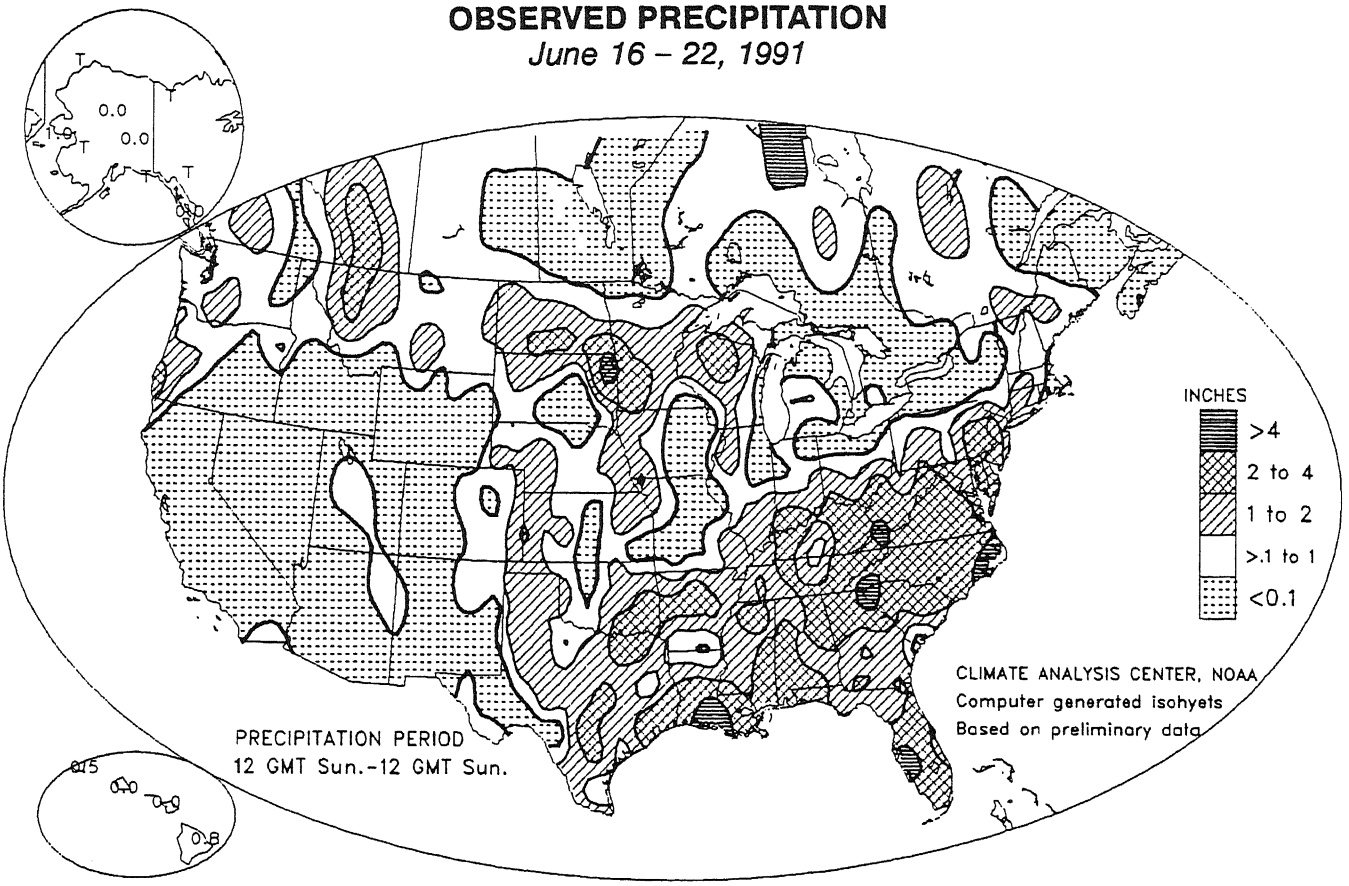
In contrast, temperatures averaged below normal in the Far West, the northern Rockies, southwestern Alaska, much of the Southwest and Hawaii, and portions of the Great Plains and Mississippi Valley. Weekly departures of -5°F and lower were observed from central California northward through Washington and western Montana (Table 3).

TABLE 1. *SELECTED STATIONS WITH 3.00 OR MORE INCHES OF PRECIPITATION DURING THE WEEK OF JUNE 16 - 22, 1991*

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
CHERRY POINT MCAS, NC	5.97	SUMTER/SHAW AFB, SC	3.70
ATLANTA, GA	5.97	JACKSON, TN	3.61
CAPE HATTERAS, NC	4.92	GOLDSBORO/SEYMOUR-JOHNSON AFB, NC	3.59
VIRGINIA BEACH/OCEANA NAS, VA	4.83	FORT MYERS, FL	3.41
WATERTOWN, SD	4.81	NEW ORLEANS/MOISANT, LA	3.29
ASHEVILLE, NC	4.56	WAUSAU, WI	3.29
LAFAYETTE, LA	4.41	KEY WEST, FL	3.28
MOBILE, AL	4.33	ANNISTON, AL	3.26
ATHENS, GA	4.33	KODIAK, AK	3.21
JACKSONVILLE/NEW RIVER NDB, NC	4.08	NORFOLK, VA	3.15
RICHMOND/BYRD, VA	4.01	AUGUSTA, GA	3.12
HOUSTON/WM. HOBBY, TX	3.84	FAYETTEVILLE/FORT BRAGG, NC	3.05
JACKSON, KY	3.80	PARKERSBURG, WV	3.05

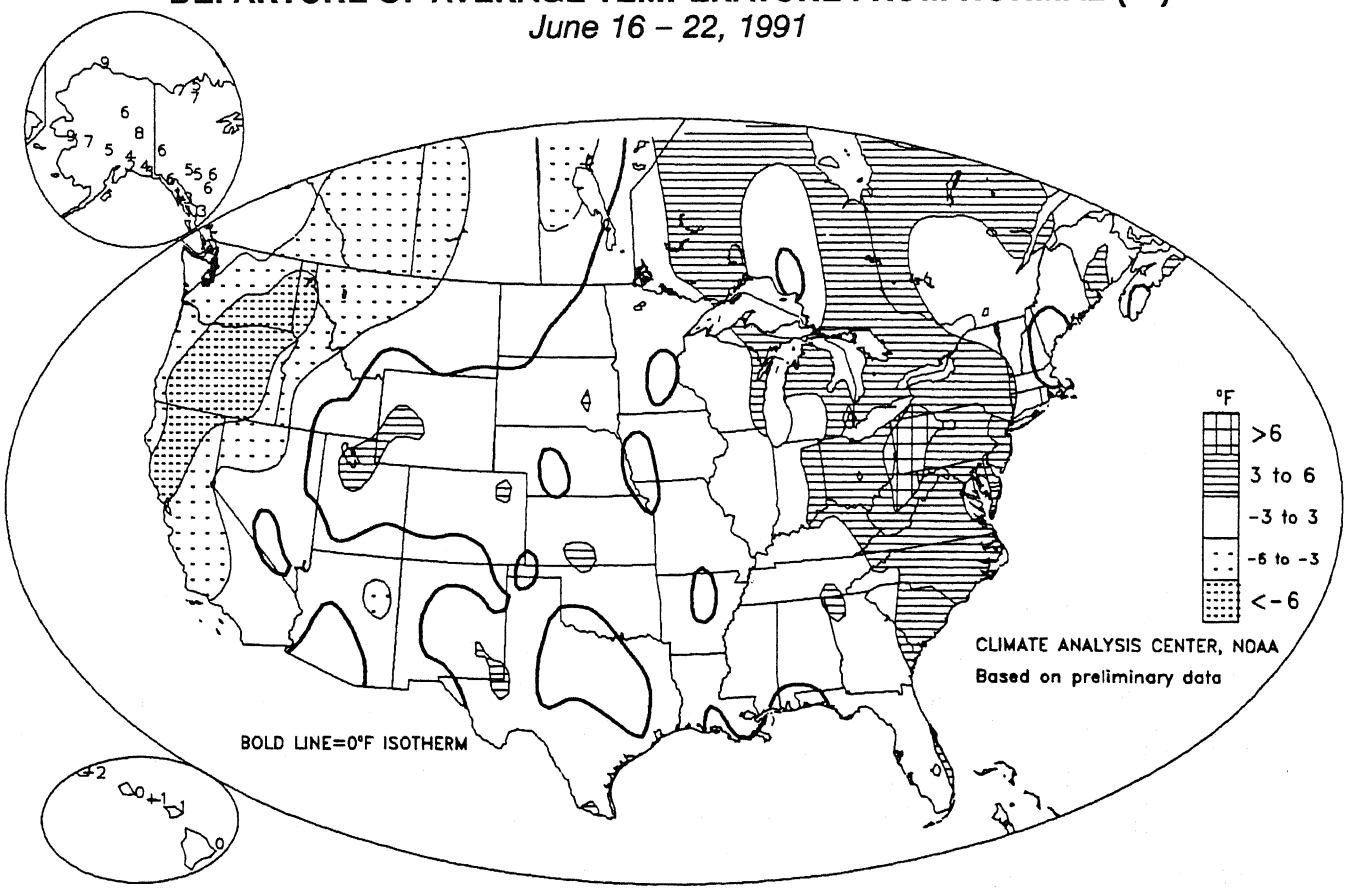
OBSERVED PRECIPITATION

June 16 – 22, 1991



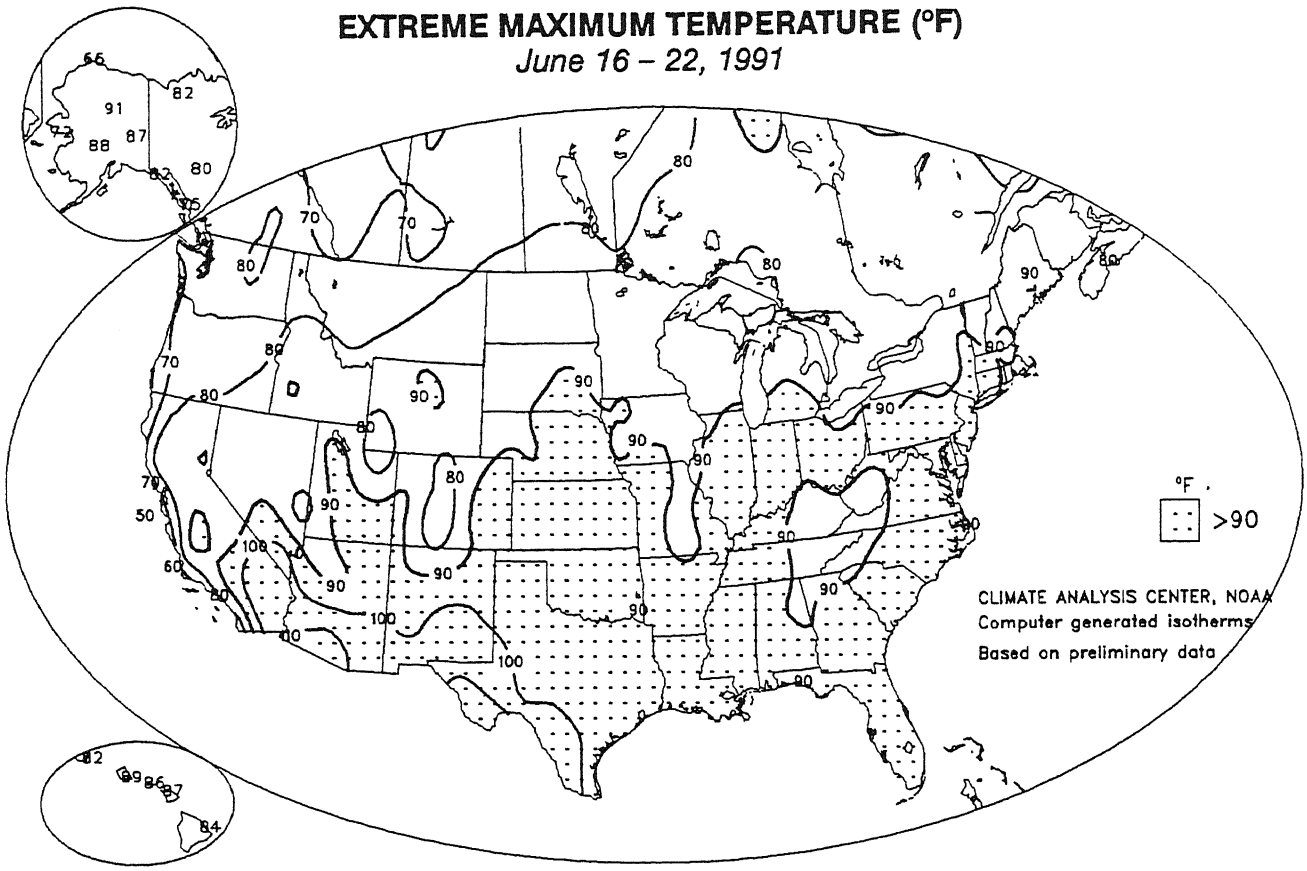
DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

June 16 – 22, 1991



EXTREME MAXIMUM TEMPERATURE (°F)

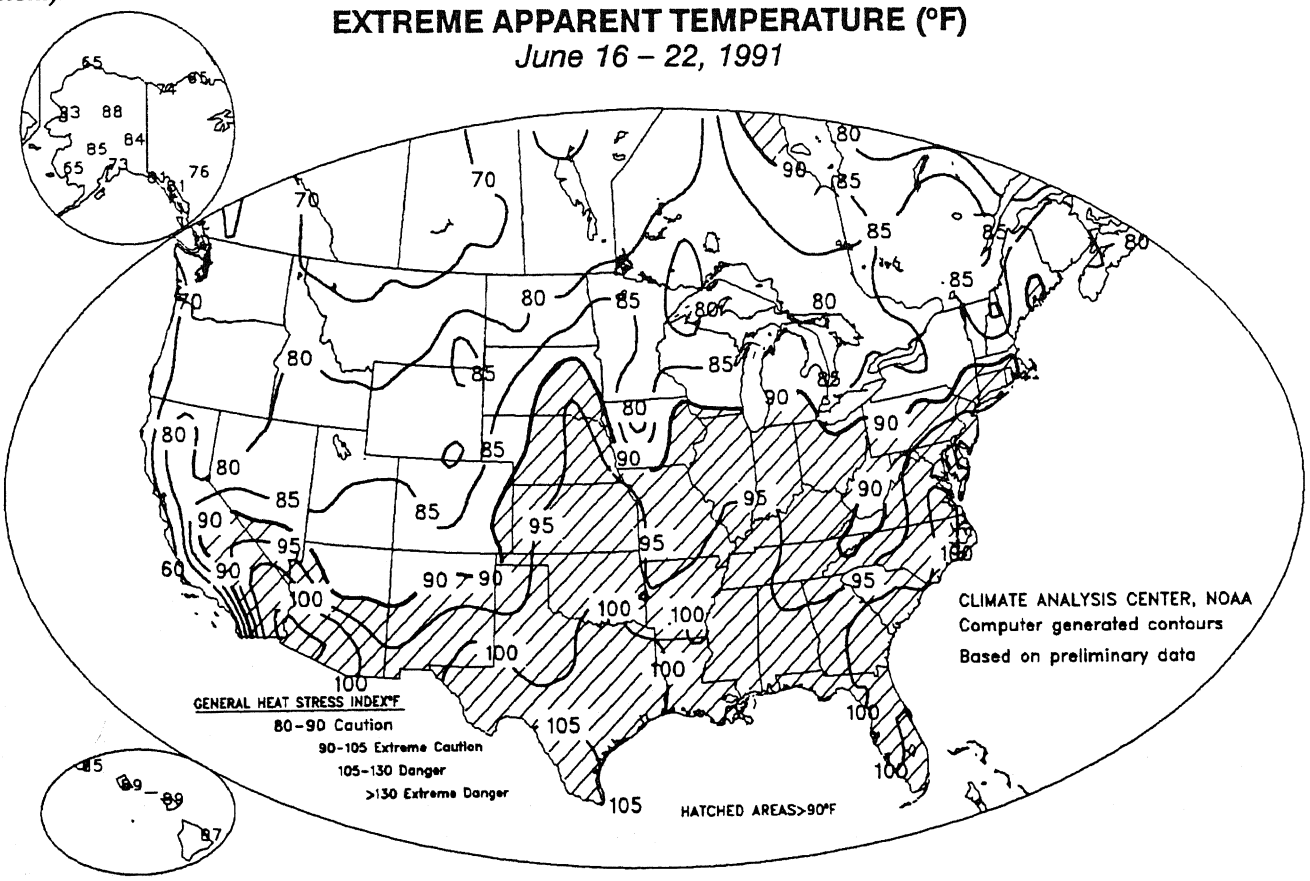
June 16 – 22, 1991



Hot weather gripped much of the Atlantic and Gulf Coast states, Midwest, central Plains, Southwest, and central Alaska with temperatures of 90°F and higher (top). High humidity combined with the heat to produce steamy conditions in parts of the southern Plains, lower Mississippi Valley, Southwest, and mid-Atlantic as apparent temperatures soared to 100°F and above (Bottom).

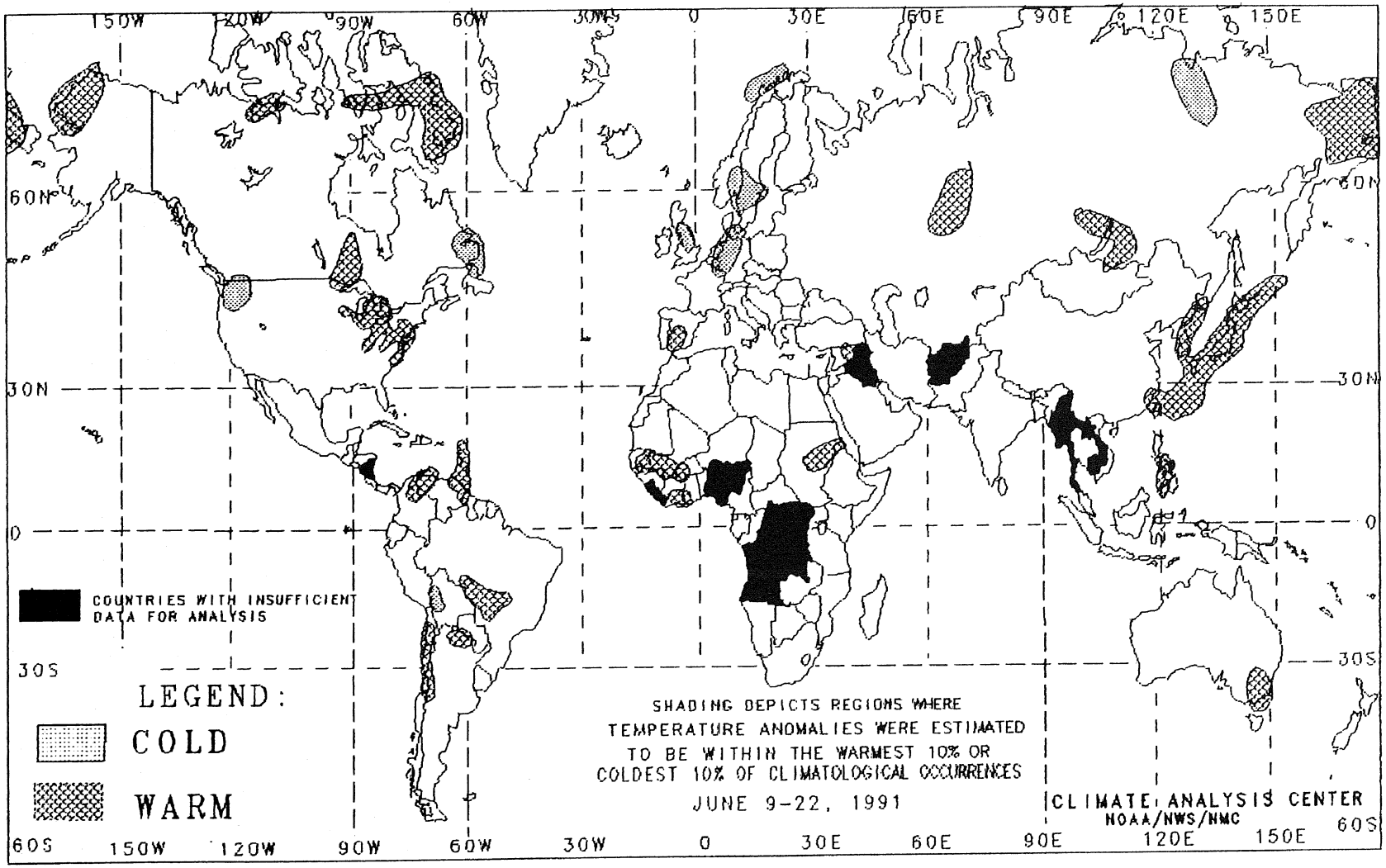
EXTREME APPARENT TEMPERATURE (°F)

June 16 – 22, 1991



2–WEEK GLOBAL TEMPERATURE ANOMALIES

JUNE 9 – 22, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty–four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

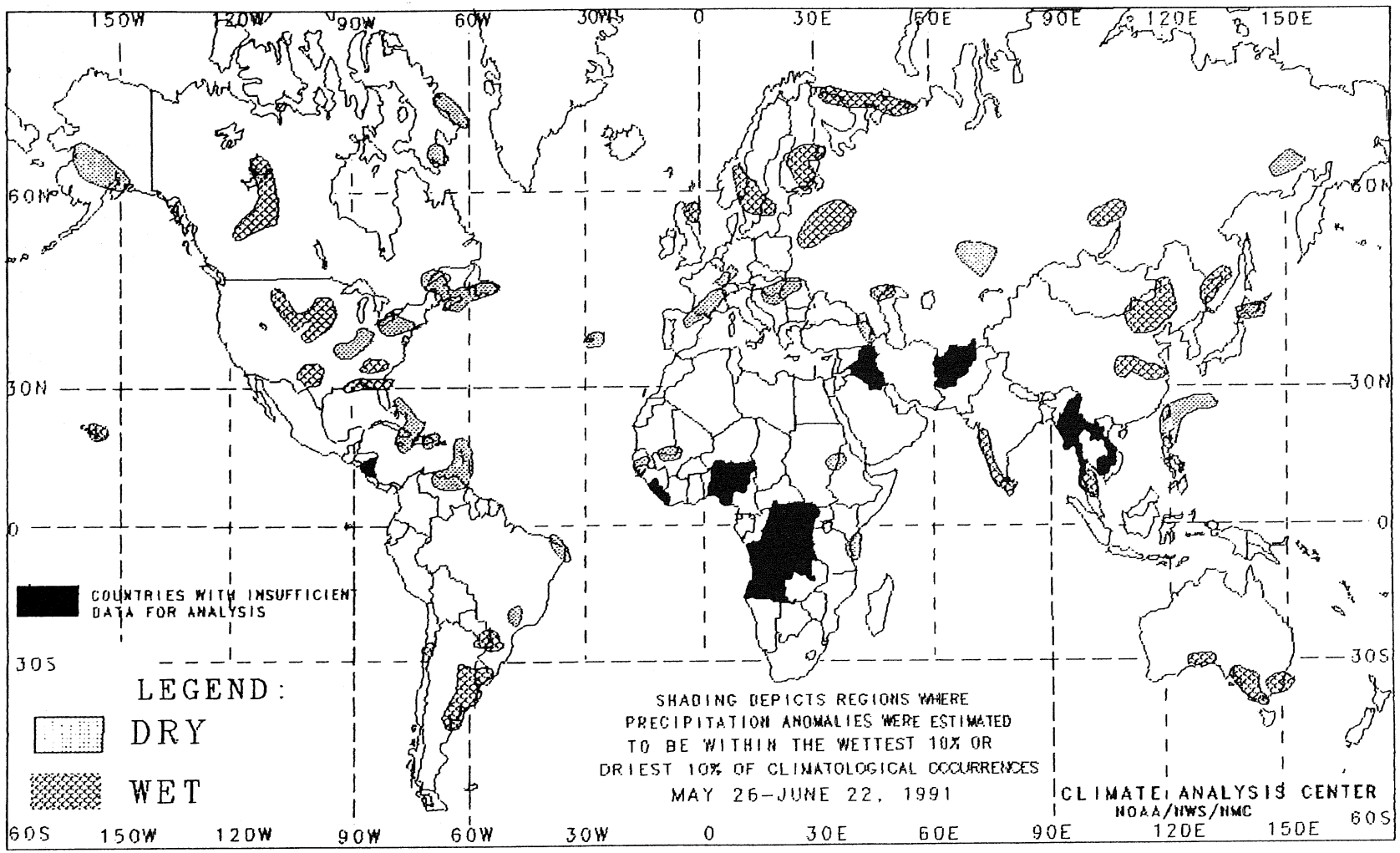
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4–WEEK GLOBAL PRECIPITATION ANOMALIES

MAY 26 – JUNE 22, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

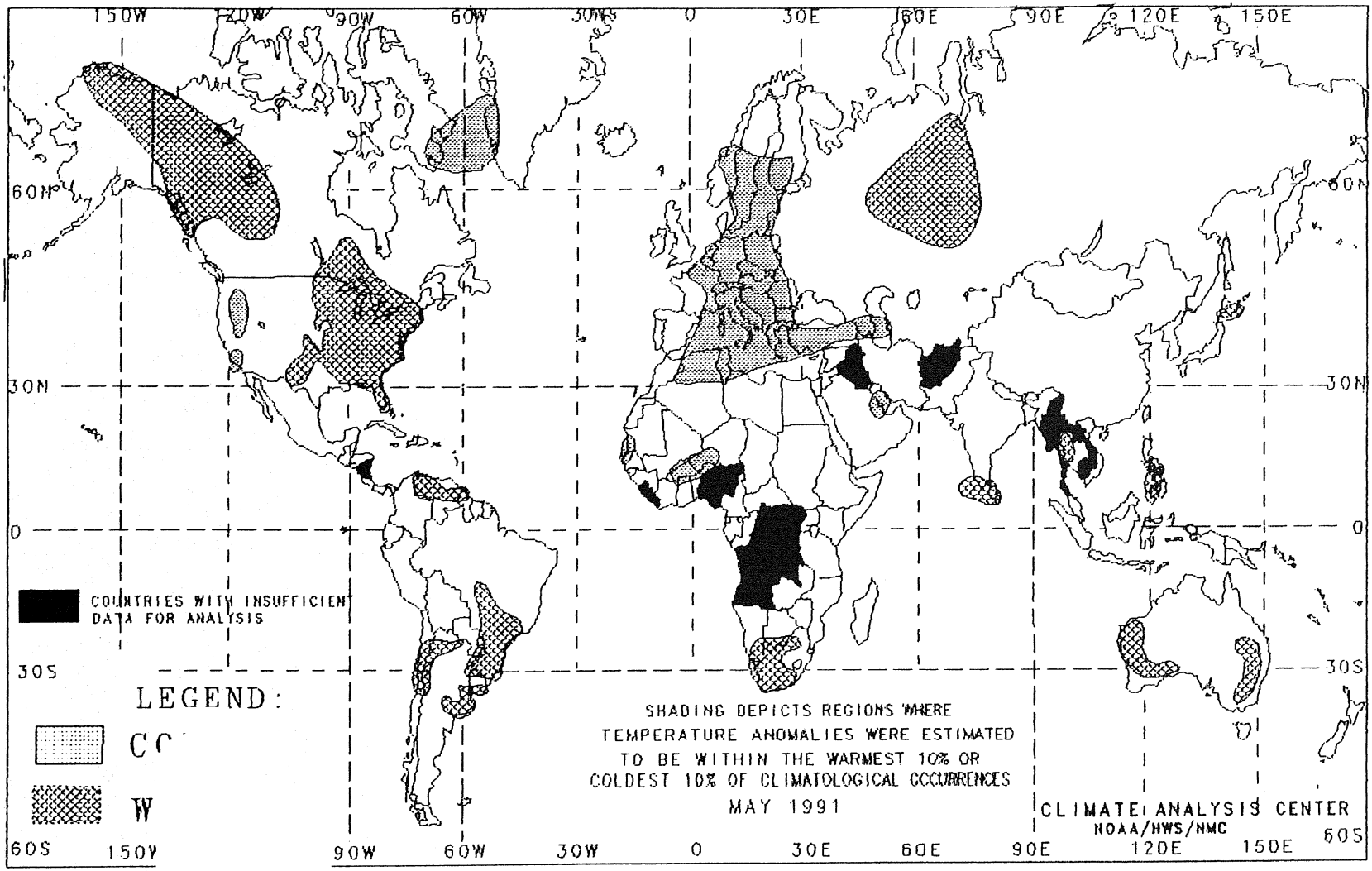
In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

MONTHLY GLOBAL TEMPERATURE ANOMALIES

MAY 1991



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This chart shows general areas of one month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

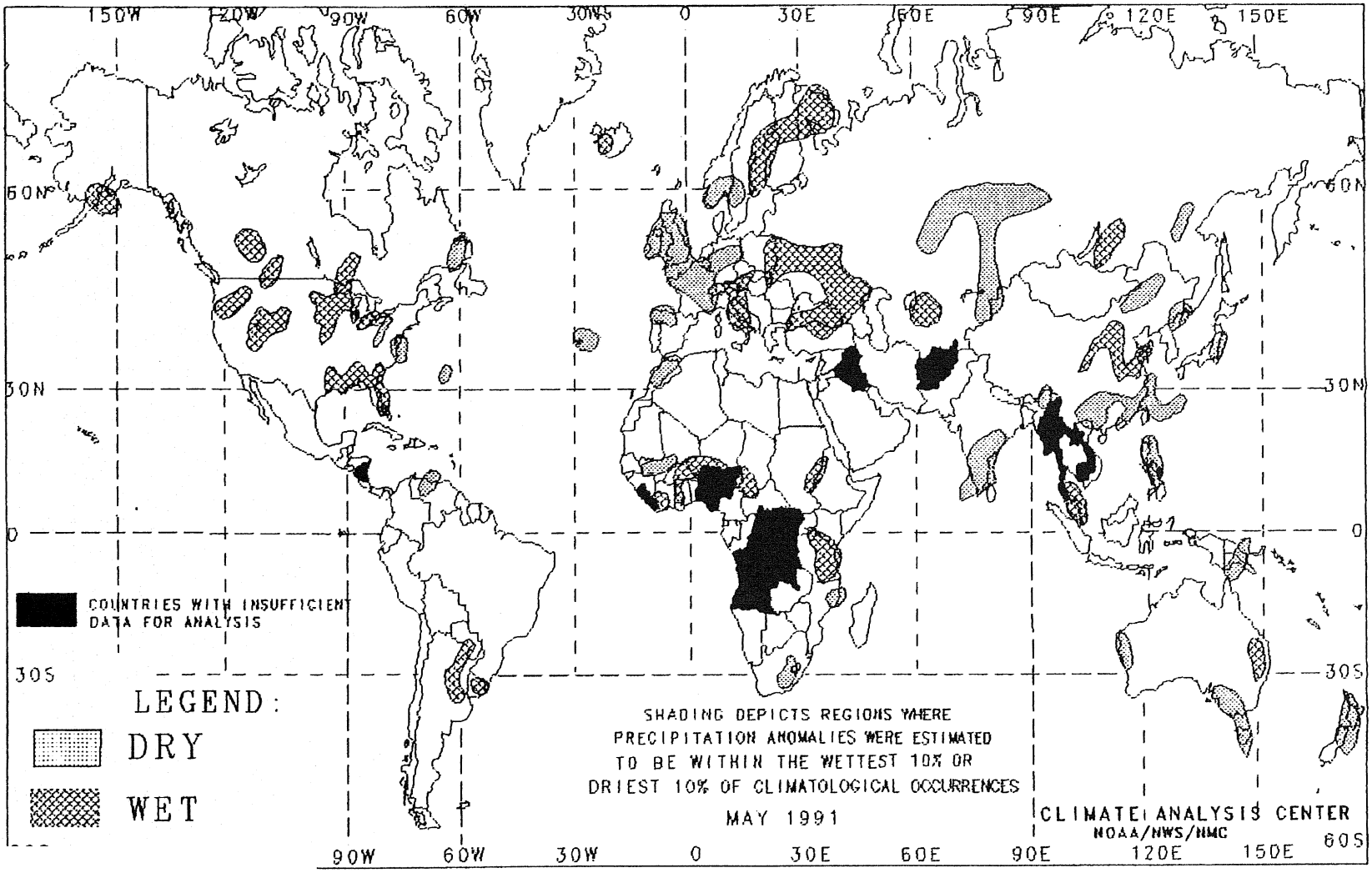
PRINCIPAL TEMPERATURE ANOMALIES

MAY 1991

REGIONS AFFECTED	TEMPERATURE AVERAGE (°C)	DEPARTURE FROM NORMAL (°C)	COMMENTS
NORTH AMERICA			
Northern Alaska and Northwestern Canada	–9 to +12	+2 to +5	MILD – 2 to 10 weeks
Eastern Oregon and Northwestern Nevada	+9 to +12	–2 to –3	Very cool second half of May
Southern California	+12 to +19	Around –2	Very cool first half of May
Eastern United States and Southeastern Canada	+4 to +28	+2 to +5	WARM – 5 to 22 weeks
Northeastern Canada and Western Greenland	–7 to 0	–2 to –4	COLD – 2 to 10 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Northern Venezuela	+26 to +30	Around +2	WARM – 2 to 4 weeks
Northern Chile and Northwestern Argentina	+14 to +22	+2 to +3	WARM – 2 to 7 weeks
Southern Brazil and Northern Uruguay	+17 to +26	+2 to +3	Very warm second half of May
Southern Uruguay and East–Central Argentina	+13 to +21	+2 to +3	WARM – 2 to 4 weeks
EUROPE AND THE MIDDLE EAST			
Europe	–7 to +19	–2 to –4	COLD – 2 to 8 weeks
Bahrain and Saudi Arabia	+28 to +29	Around –2	COOL – 5 weeks
AFRICA			
Northern Africa	+20 to +32	Around –2	COOL – 2 to 9 weeks
Western Senegal	+21 to +23	–2 to –3	Very cool late in May
Burkina Faso and Niger	+27 to +32	Around –2	Very cool second half of May
Southern Africa	+15 to +19	+2 to +3	WARM – 2 to 4 weeks
ASIA			
Western Siberia	+4 to +17	+3 to +5	MILD – 2 to 12 weeks
Northwestern Thailand	+30 to +32	Around +2	Very warm first half of May
Southern India	+30 to +32	+2 to +4	Very warm first half of May
Northern Japan	+9 to +14	Around +2	MILD – 5 to 14 weeks
AUSTRALIA AND WESTERN PACIFIC			
Philippines	+29 to +31	+2 to +3	WARM – 4 weeks
Western Australia	+16 to +22	+2 to +3	WARM – 2 to 5 weeks
Eastern Australia	+14 to +18	+2 to +3	Very warm second half of May

MONTHLY GLOBAL PRECIPITATION ANOMALIES

MAY 1991



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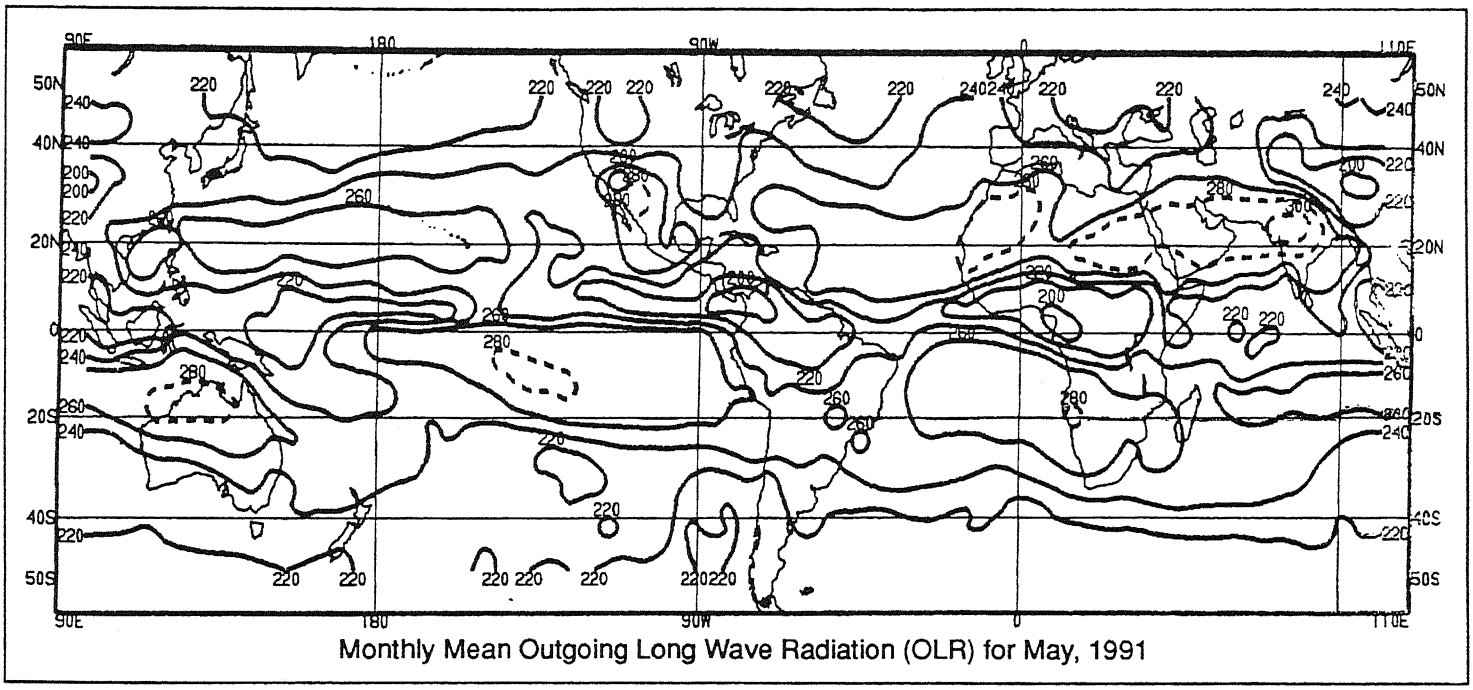
The chart shows general areas of one month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

PRINCIPAL PRECIPITATION ANOMALIES

MAY 1991

REGIONS AFFECTED	PRECIPITATION TOTAL (MM)	PERCENT OF NORMAL	COMMENTS
NORTH AMERICA			
South–Central Alaska	60 to 247	185 to 202	Heavy precipitation first half of May
Southwestern Canada	64 to 100	195 to 266	WET – 2 to 5 weeks
North–Central Montana and Adjacent Canada	90 to 100	209 to 253	WET – 2 to 10 weeks
Northern Oregon	81 to 153	163 to 310	WET – 2 to 10 weeks
Intermountain West	71 to 121	226 to 263	WET – 2 to 6 weeks
North–Central United States and South–Central Canada	122 to 224	167 to 254	WET – 2 to 16 weeks
Midwestern United States	108 to 187	161 to 289	Heavy precipitation second half of May
Ohio, Pennsylvania, and West Virginia	25 to 40	31 to 48	DRY – 6 to 7 weeks
Eastern Quebec	25 to 49	39 to 53	DRY – 4 to 12 weeks
Eastern Virginia and Eastern North Carolina	12 to 23	12 to 26	DRY – 9 weeks
Southeastern United States	177 to 382	181 to 331	WET – 2 to 14 week
Bermuda	Around 12	Around 12	DRY – 5 weeks
SOUTH AMERICA AND EASTERN PACIFIC			
Northern Venezuela	1 to 53	1 to 28	DRY – 5 to 10 weeks
Northeastern Argentina	51 to 384	243 to 683	WET – 2 to 11 weeks
Uruguay	247 to 288	243 to 310	WET – 4 to 5 weeks
EUROPE AND THE MIDDLE EAST			
Iceland	111 to 120	182 to 301	WET – 2 to 4 weeks
Azores	1 to 4	2 to 9	DRY – 8 to 10 weeks
Northwestern Spain	10 to 23	22 to 33	DRY – 5 to 10 weeks
Western Europe	4 to 35	6 to 49	DRY – 4 to 14 weeks
Southern Norway and Southern Sweden	7 to 12	11 to 30	DRY – 4 to 10 weeks
Eastern Scandinavia and Adjacent Soviet Union	42 to 77	170 to 246	WET – 4 to 5 weeks
Italy and Austria	83 to 338	164 to 449	DRY – 4 weeks
Turkey and Ukrainian S.S.R.	49 to 169	163 to 287	WET – 2 to 7 weeks
AFRICA			
Morocco	0 to 12	0 to 42	DRY – 9 weeks
Southwestern Mali	0 to 16	0 to 36	DRY – 6 to 10 weeks
Southwestern Ivory Coast	221 to 285	142 to 157	WET – 4 to 5 weeks
Burkina Faso and Niger	54 to 449	172 to 608	WET – 2 to 10 weeks
Southwestern Chad	80 to 173	175 to 270	WET – 5 to 10 weeks
Southeastern Sudan	96 to 189	198 to 226	Heavy precipitation second half of May
Tanzania	80 to 358	217 to 597	WET – 4 to 5 weeks
Northern Mozambique	2 to 7	12 to 21	DRY – 7 weeks
South–Central South Africa	0 to 3	0 to 10	DRY – 9 to 14 weeks
ASIA			
Uzbek S.S.R.	61 to 74	532 to 733	WET – 10 weeks
Kazakh S.S.R.	0 to 24	0 to 45	DRY – 8 to 14 weeks
Eastern Lake Baykal	40 to 64	205 to 311	WET – 10 weeks
Southeastern Siberia	8 to 18	20 to 28	DRY – 5 weeks
Central Japan	46 to 61	41 to 42	DRY – 5 weeks
Northeastern China	2 to 4	7 to 13	DRY – 5 to 9 weeks
North Korea	4 to 22	11 to 46	DRY – 4 weeks
East–Central China	73 to 256	170 to 308	WET – 5 weeks
Taiwan and Southeastern China	13 to 111	5 to 49	DRY – 4 to 14 weeks
Extreme Eastern India	24 to 29	8 to 10	DRY – 10 weeks
Southern India	0 to 33	0 to 14	DRY – 14 weeks
Peninsular Malaysia	218 to 479	188 to 245	WET – 5 to 6 weeks
AUSTRALIA AND WESTERN PACIFIC			
Philippines	2 to 8	2 to 6	DRY – 10 weeks
Papua New Guinea	4 to 94	9 to 25	DRY – 6 weeks
Western Australia	4 to 9	9 to 28	DRY – 10 weeks
Eastern Australia	109 to 176	299 to 449	Heavy precipitation second half of May
Southeastern Australia	3 to 46	6 to 36	DRY – 5 to 18 weeks
New Zealand	11 to 51	16 to 43	DRY – 5 weeks

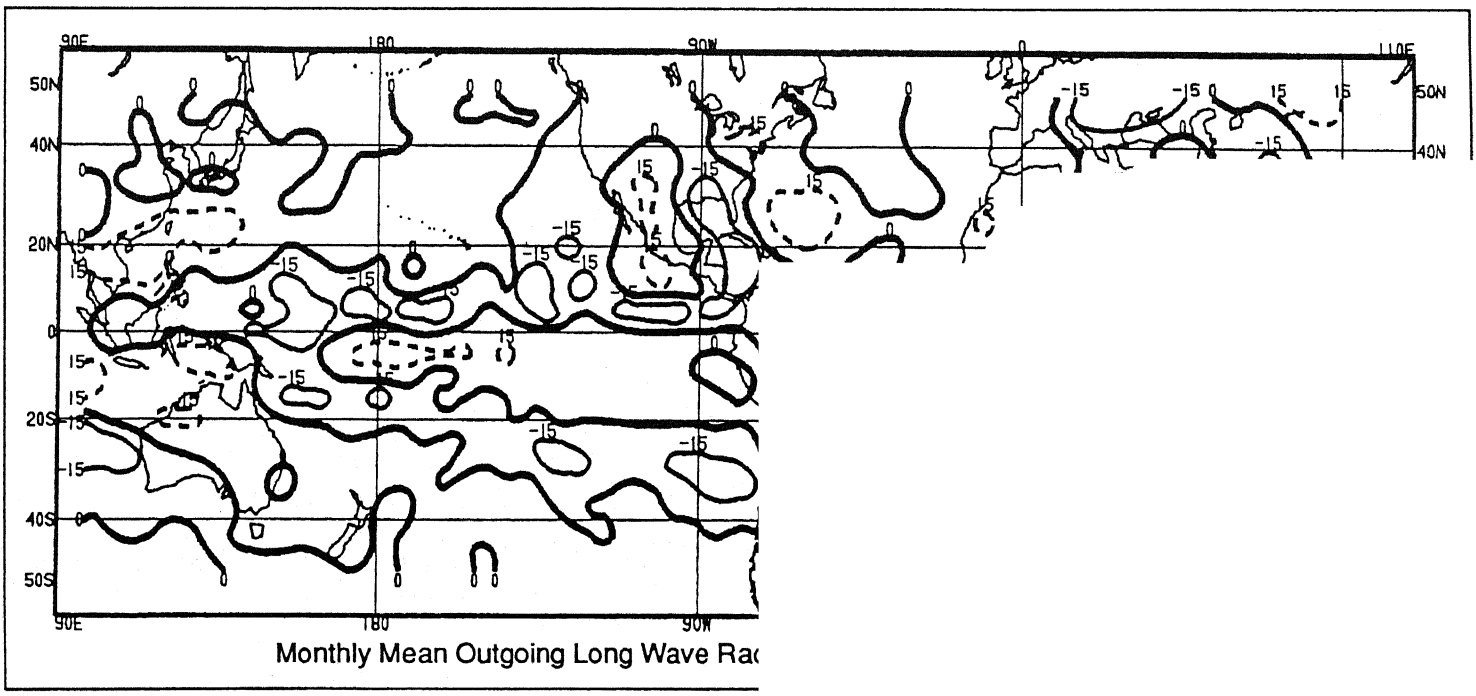


Monthly Mean Outgoing Long Wave Radiation (OLR) for May, 1991

EXPLANATION

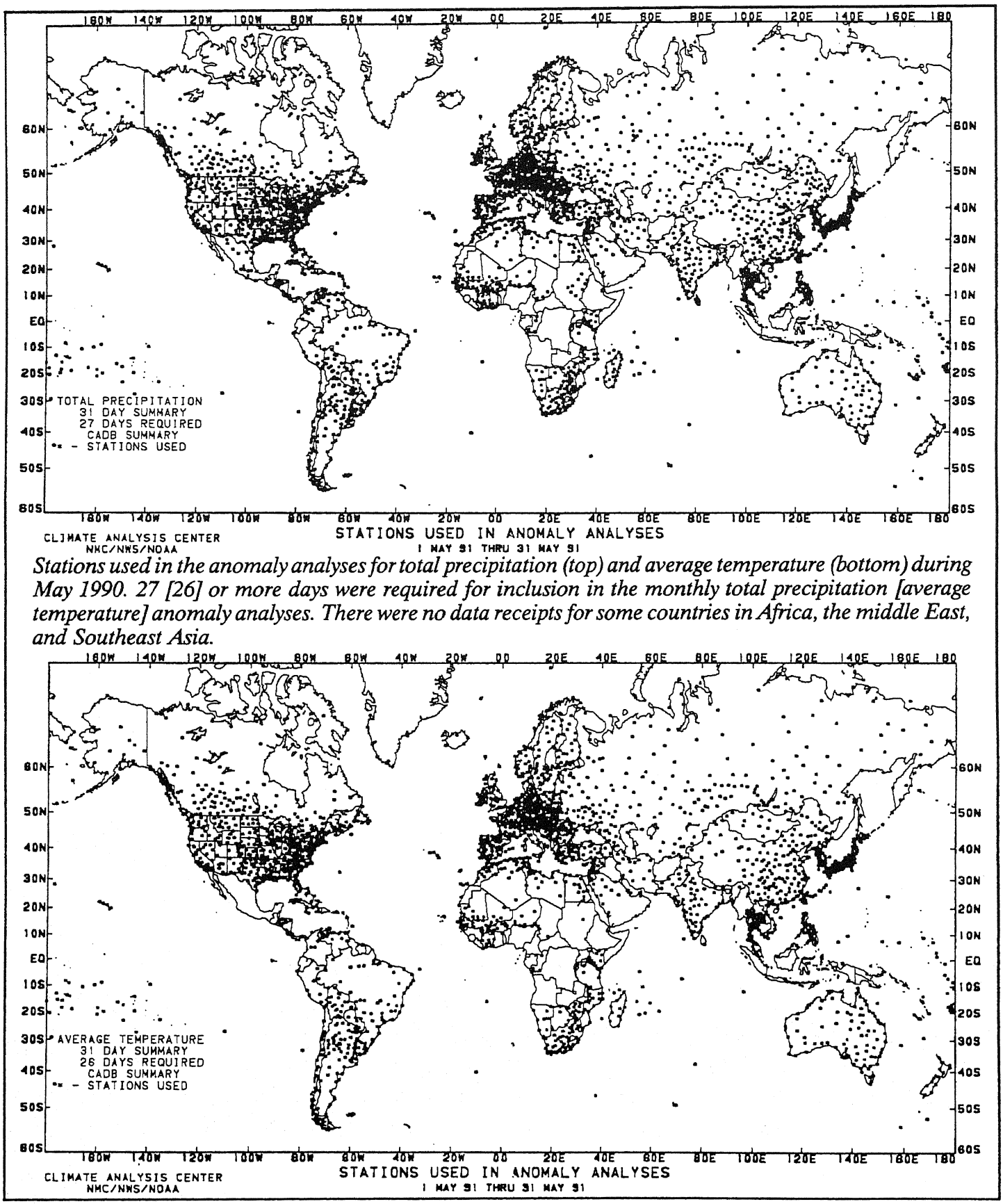
The mean monthly outgoing long wave radiation (OLR) as measured by the NOAA–9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2}, and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes 20°N – 20°S) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non–convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 – 1988 base period mean. Contour intervals are 15 Wm^{-2}, while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Monthly Mean Outgoing Long Wave Ra

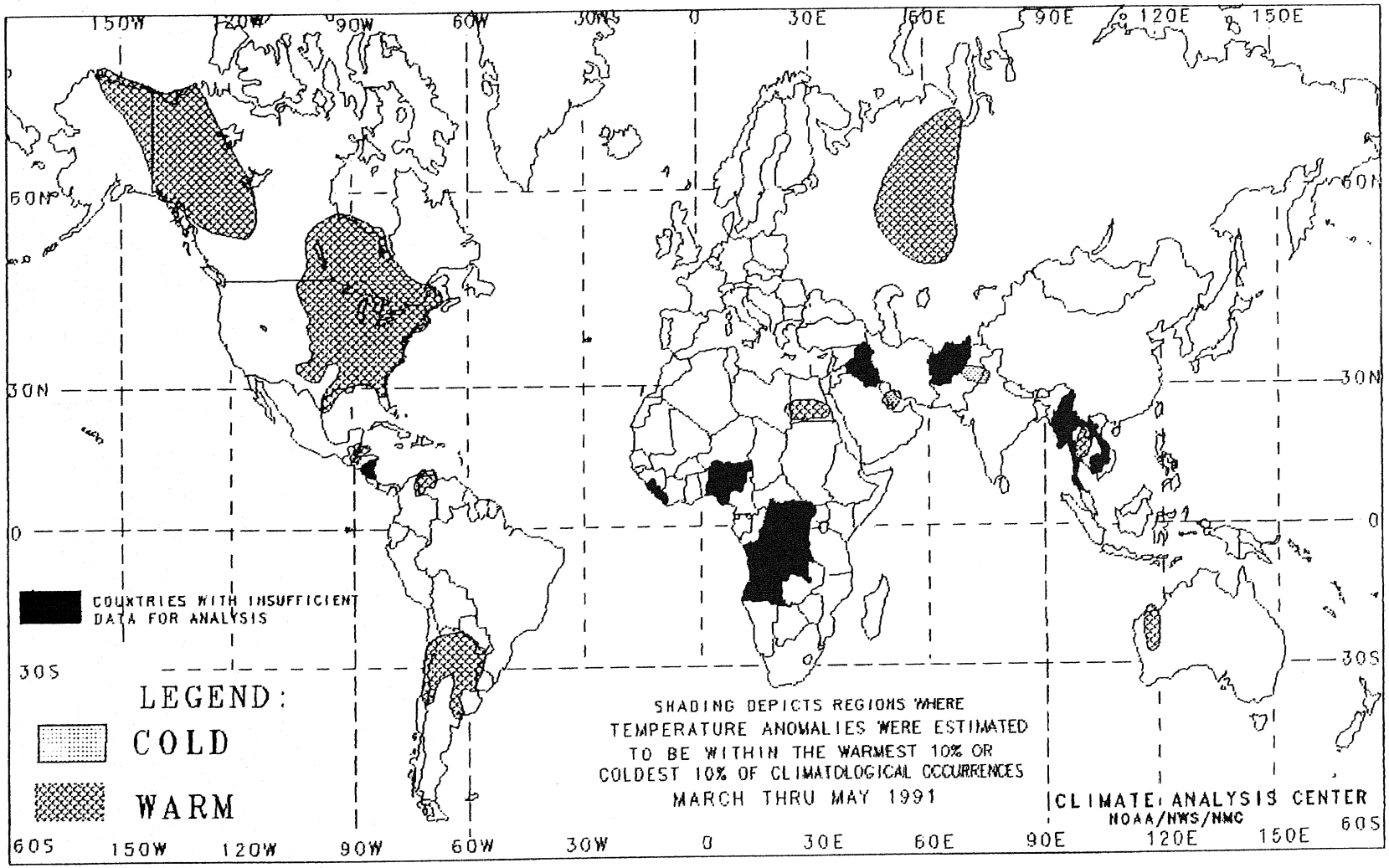
STATIONS USED IN THE MONTHLY ANOMALY ANALYSES



Stations used in the anomaly analyses for total precipitation (top) and average temperature (bottom) during May 1990. 27 [26] or more days were required for inclusion in the monthly total precipitation [average temperature] anomaly analyses. There were no data receipts for some countries in Africa, the middle East, and Southeast Asia.

3–MONTH GLOBAL TEMPERATURE ANOMALIES

MARCH – MAY, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 78 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty–four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have reulted in an overestimation of the extent of some warm anomalies.

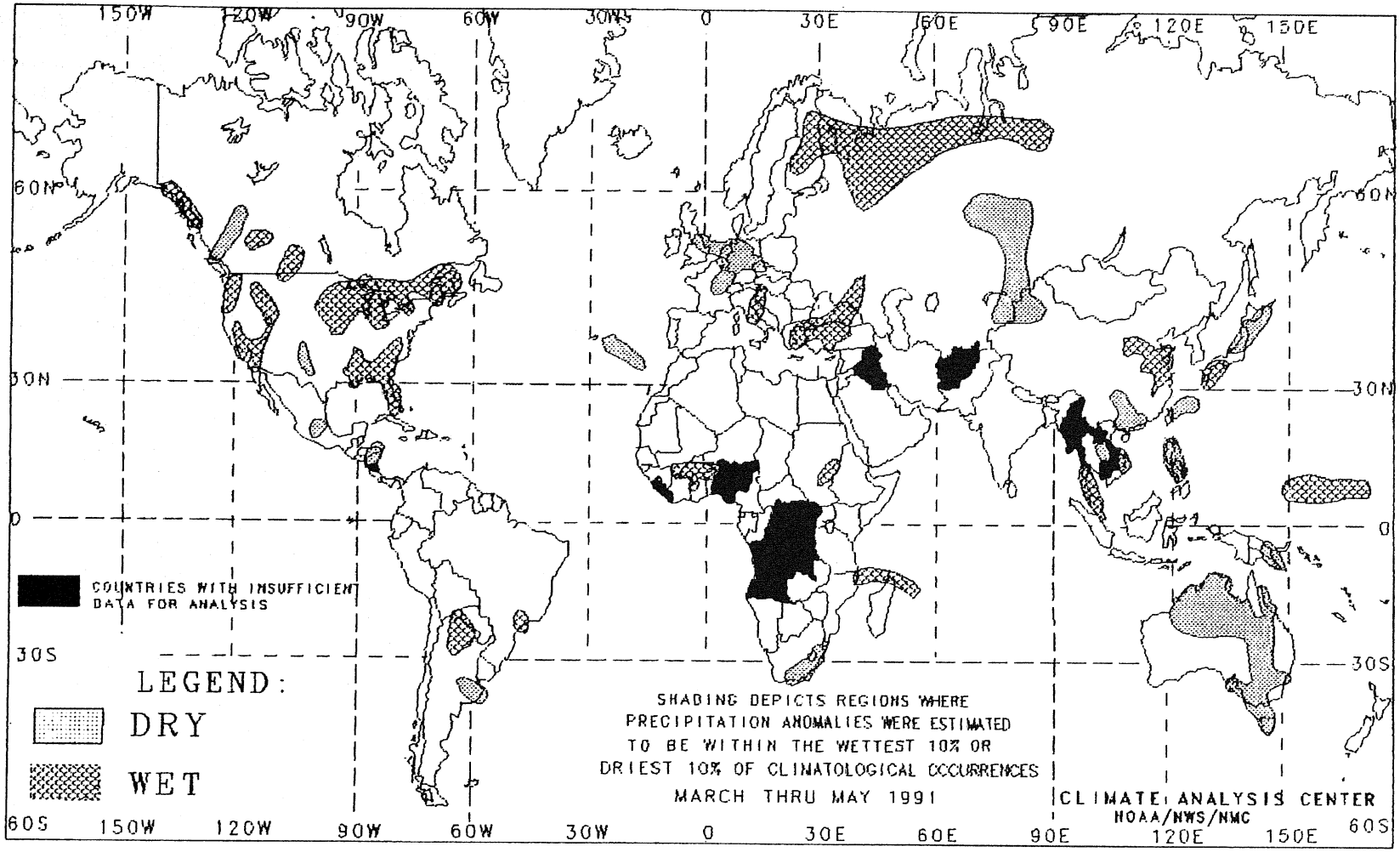
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

3–MONTH GLOBAL PRECIPITATION ANOMALIES

MARCH – MAY, 1991

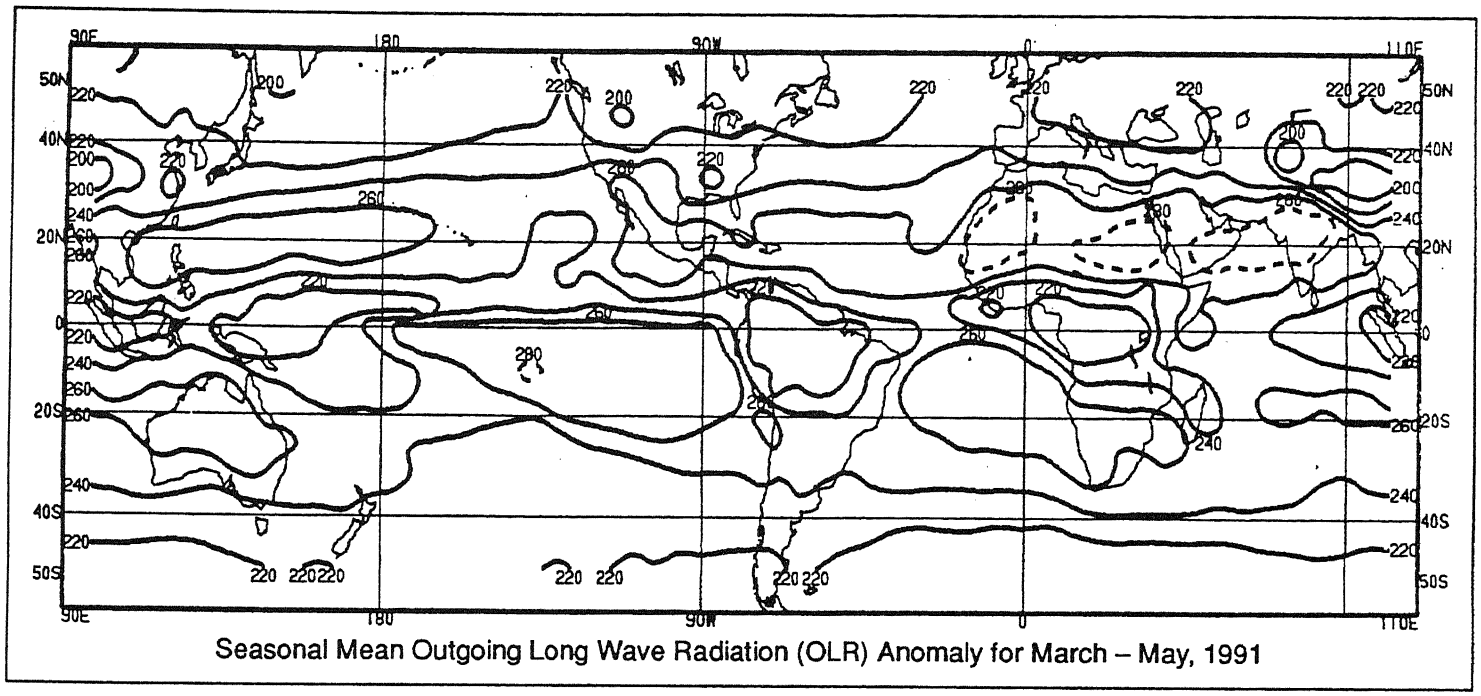


The anomalies on this chart are based on approximately 2500 observing stations for which at least 81 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the three month period is less than 50 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total three month precipitation exceeds 125 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of three month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

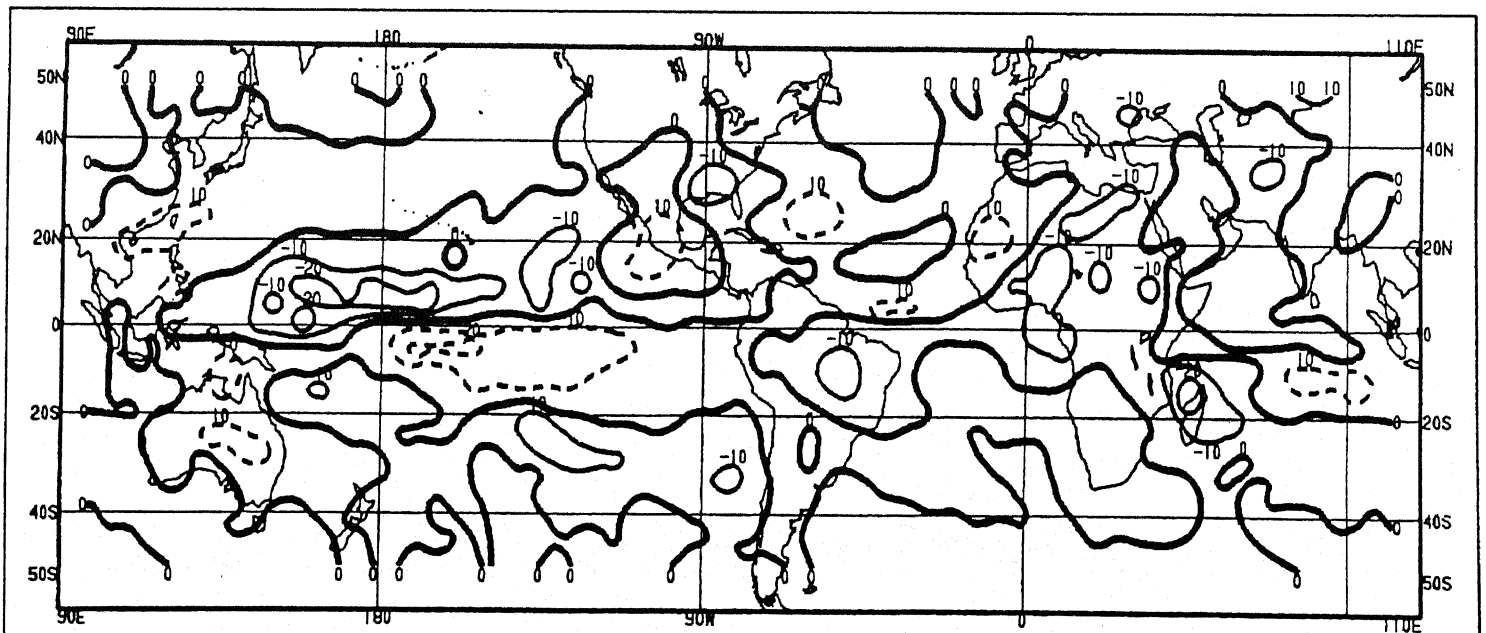


Seasonal Mean Outgoing Long Wave Radiation (OLR) Anomaly for March – May, 1991

EXPLANATION

The mean seasonal outgoing long wave radiation (OLR) as measured by the NOAA–9 AVHRR IR window channel by NESDIS/SRL (top). Data are accumulated and averaged over 2.5° areas to a 5° Mercator grid for display. Contour intervals are 20 Wm^{-2}, and contours of 280 Wm^{-2} and above are dashed. In tropical areas (for our purposes 20°N – 20°S) that receive primarily convective rainfall, a mean OLR value of less than 200 Wm^{-2} is associated with significant monthly precipitation, whereas a value greater than 260 Wm^{-2} normally indicates little or no precipitation. Care must be used in interpreting this chart at higher latitudes, where much of the precipitation is non–convective, or in some tropical coastal or island locations, where precipitation is primarily orographically induced. The approximate relationship between mean OLR and precipitation amount does not necessarily hold in such locations.

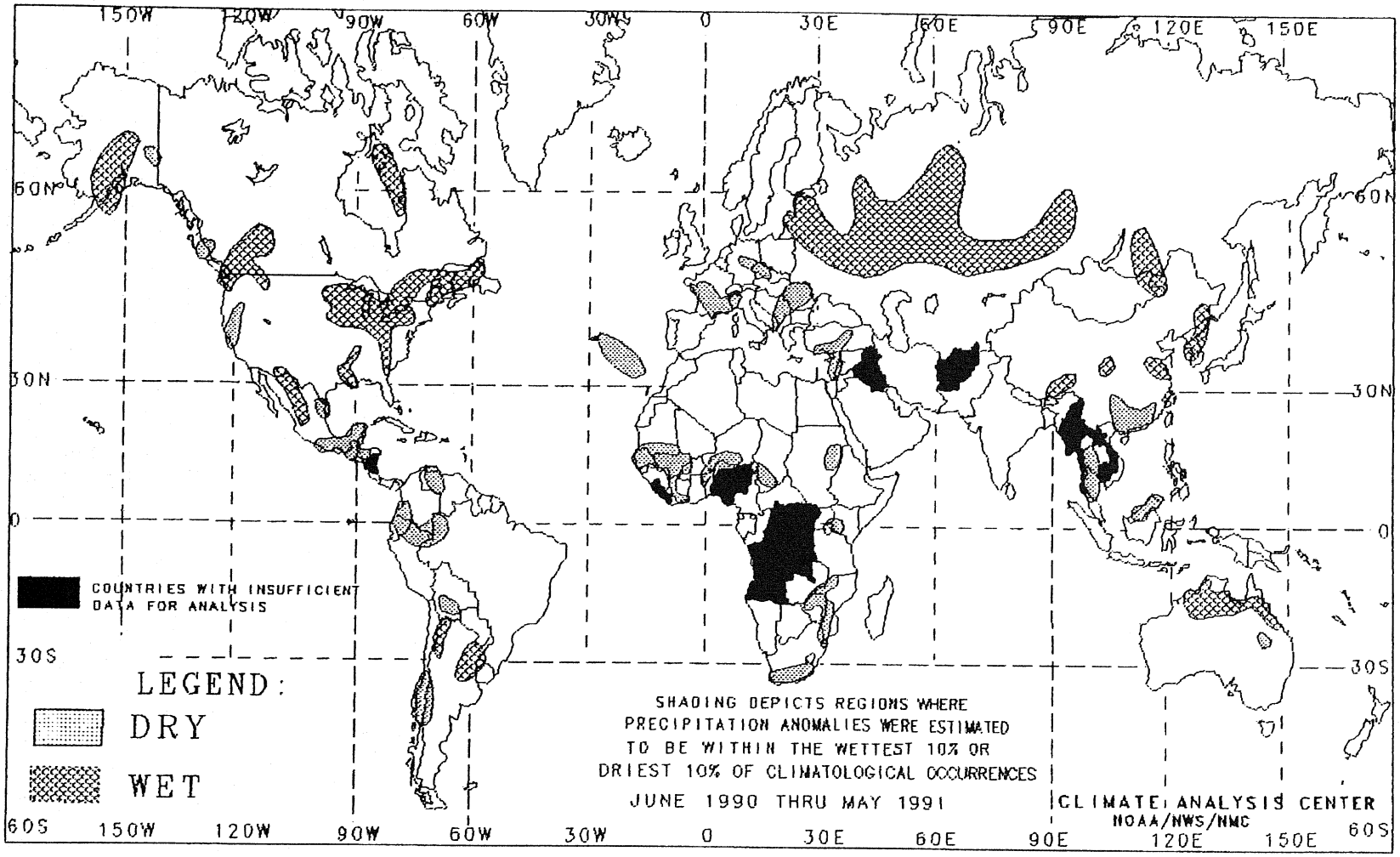
The mean monthly outgoing long wave radiation anomalies (bottom) are computed as departures from the 1979 – 1988 base period mean. Contour intervals are 15 Wm^{-2}, while positive anomalies (greater than normal OLR, suggesting less than normal cloud cover and/or precipitation) are dashed and negative anomalies (less than normal OLR, suggesting greater than normal cloud cover and/or precipitation) are solid.



Seasonal Mean Outgoing Long Wave Radiation (OLR) Anomaly for March – May, 1991

12–MONTH GLOBAL PRECIPITATION ANOMALIES

JUNE 1990 – MAY 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 350 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the twelve month period is less than 100 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total twelve month precipitation exceeds 250 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of twelve month precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.